SPRT®
SP-T5
Portable Dot Matrix Printer

User's Manual

Content

Operating Precautions

This section presents important information intended to ensure safe and effective use of the printer. Please read the following carefully.

Notes on Safety

Be sure to use the specified battery and power source provided by our company. Connection to an improper power source may cause fire, explosion or damage to the printer.

Don't put the battery into the fire or water, don't disassemble or modify the battery, don't be short circuit, otherwise may result in injury or fire even explosion.

If the printer would not be used for a long time, be sure to take off the battery, otherwise the battery may leak liquid which is corrosive, if improper operation causes battery leak, and the liquid is spattered on the skin or clothes, please wash it with water, if spattered in the eyes, please rinse them with water thoroughly and see a doctor.

Please do not open the paper case cover when it is printing or just when printing is over, do not touch the print head with hand or body, overheat may cause scald.

Notes on Using

Be sure not to print continuously over 1 meter, otherwise may cause damage to the print head.

Water or other liquid should not spill into the printer, also the printer should not be appeared in the rain, or else may cause printer damage.

Please do not open the paper case cover when it is printing, otherwise the printer may work improperly.

If print with serial interface, should not unplug the interface cable in the course of printing, or else some printing data may be lost.

When print in Ir or IrDA mode, be sure the Ir window of the host equipment face rightly the Ir window of the printer, the distance should be within the range of 80mm, and the angle should be within the range of 30°.

When print with Bluetooth interface, the communication distance should be within 10 meters, otherwise the printer doesn't print or prints rubbish codes.

Too high（45℃）or too low（5℃） temperature and too high (85％)or too low (20％) relative humidity both effect the print quality.

The print paper in poor quality or stored for too long time also may reduce the print quality even damage the printer.

Be sure to use up the electricity of the battery before charge it, as it can ensure the using life of the battery.

Notes on Handling
The printer should be placed in such an environment that the temperature is between -20℃ and 60℃, and the relative humidity is between 5% and 95%.

If the printer will be stored for a long time, pleas be sure to take out the battery, otherwise may damage the battery and printer.

When the Li battery is stored over 3 months,it shoud be taken out to charge one time, in order to avoid the battery damage.

Chapter 1   Outer Appearance and

Accessories

1.1 Outer Appearance
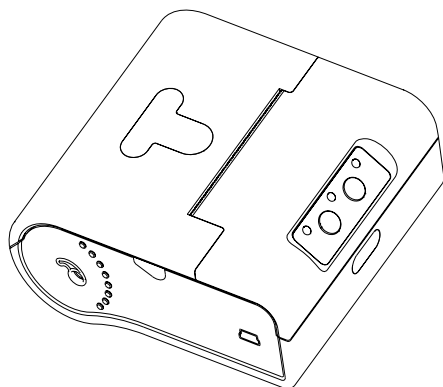
1.2 Standard Accessories

Power Adaptor   1 unit

Rechargeable Li-ion Battery 1 unit

Testing Paper 1 roll

Environmental Case   1 unit

Shoulder Strap   1 unit

Interface Cable   1 unit

Chapter 2   General Specifications

Model	SP-T5

Physical Specification	
Outer Dimension	112×98×46（L×W×H）
Weight	340g（Paper roll excluded）
Paper Diameter	≤60mm
Printing Specification	
Printing Method	Impact Dot Matrix
Paper Width	58±0.5mm
Dot/line	240dots
Printing Speed	>5.5mm /s
Paper Thickness	0.06～0.085mm
Black Mark Checking	Available
Reliability	50 km
Built-in Character Set	English: ASCII（6×12 / 8×16） Chinese: GB18030 (16×16 / 12×12)
Interface Specification	
Wire	RS-232
Wireless	IrDA / Bluetooth（V1.1 Class 2）
Power Specification	
Battery	1500mAh/7.4V
Power Adaptor	12V/2A
Battery Duration	32m continuous printing (12.5% density)
Environment Specification	
Operation Temperature/Humidity	-10℃～50℃/20％～80％
Charging	5℃～35℃/20％～80％

Temperature/Humidity	
Storage Temperature/Humidity	-20℃～60℃/5％～95％

Chapter 3 Operation

3.1 Using Preparation

3.1.1 Battery Installation
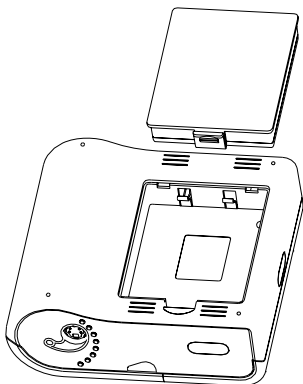
3.1.2 Paper Installation
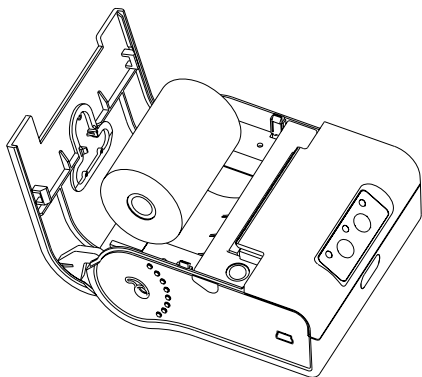
3.2 Operation Specification

Paper out Indicator   Charging Indicator   Power Indicator

MODE

FEED   POWER

Paper Feed Button   Power Button
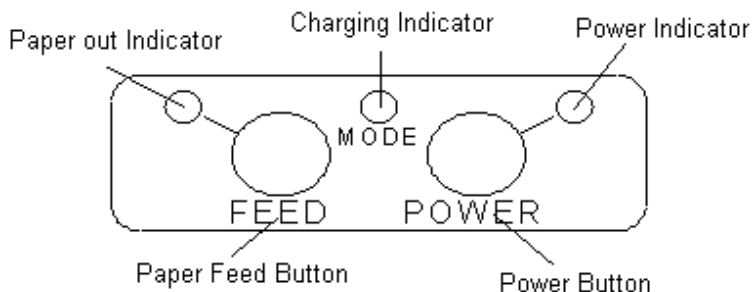
3.2.1 Printer On/Off

The printer is powered on by pressing the power button for about 1 second; the power indicator is on with blue color when the printer is on. If press the power button for about 1 second again, the printer will be turned off, all the indicators are off when the printer is off.

3.2.2 Self-test

The self-test checks the printer's current settings, status and whether the printer has any problems. Turn on the power while holding down the FEED button, the self-test begins. The printer is ready to receive data as soon as it completes the self-test.

3.2.3 Paper Feeding

When the printer works normally, hold down【FEED】button, the paper feeding begins, and stops when hold down【FEED】button again.

3.2.4 Paper Tearing

After each receipts is finished printing, it needs to tear off the paper along the tear bar. Please don't use too much strength. Otherwise the paper will be pulled out from the paper case.

3.2.5 Battery Using and Charging

When the battery is low, the power indicator blinks and the buzzer rings 3 times; if the printer is in sleeping mode, the printer will cut off power after the buzzer rings 3 times. In this case, you must charge the battery by using the adaptor.

The charging method is as following: turn off the printer, connect the adapter to the power socket with 220V, 50HZ, then plug the power charging cable to the power socket of the

printer, so the power charging begins, during the course of power charging, the charging indicator goes red, and turns to blue when the charging is over. It takes about 3 hours to charge the battery. When the charging indicator is purple, it means battery uninstalled or battery not contacted well. If powered on the printer by the external power supply and without the battery, the charging indicator is blue.

Notice: it would better not turn on the printer during the course of charging power, lest the charging time goes longer.

3.3 Printer Interface Connection
3.3.1 RS-232 Serial Interface

The standard accessories for T5 printer include: DB-9 serial interface cable (one end is D model standard serial interface socket, connected to host computer, the other end is PS/2 socket, connected to printer).

When connect the serial interface, if it works normally, then the printer stops to received data from Bluetooth, or IrDA interface.

The specification of serial interface of T5 as below:

Data Transfer: Serial

Synchro Mode: asynchronous

Handshaking: Hardware RST/CTS or Xon/Xoff optional

Signal Level: RS-232

Baud Rate:1200, 2400, 4800, 9600, 19200, 38400, 57600，115200bps optional

Data Bit: 7 bit, 8 bit optional

Parity: Odd, Even, None optional

Stop Bit: 1 bit

The ex-factory default setting is:

Baud rate: 9600bps

Handshaking: hardware

Data Bit: 8 bit

Parity: none

User can change the settings by using the Setting Tool.

Definition for the PS/2 socket:
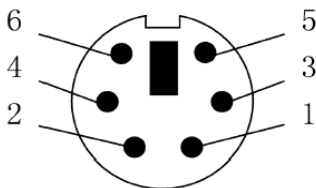
1.TXD: send data

2.DTR: ready signal

3.RXD: receive data

4.RTS: when the signal is "MARK", means printer is busy, can't receive data; when the signal is "SPACE", means the printer is ready to receive data.

5.GND: ground

6.NC: no connection

Notice: The pin of NC is kept for our other usage, developers

please don't use this pin if making connecting line, otherwise the printer might be not used normally or damaged.

When prints large quantities of data, the handshaking need to be used. When using Bluetooth and IrCOMM, developers need not to consider handshaking. When use Raw-Ir can not use hardware control.

When the printer was controlled by hardware, follow below method to connect the host and the printer:

Printer	Host
RXD	TXD
RTS	CTS
GND	GND

When the printer was controlled by software, follow below method to connect the host and the printer：

Printer	Host
RXD	TXD
TXD	RXD
GND	GND

3.3.2 IrDA Interface

The hardware of T5 with infrared port printer is compatible with IrDA1.1. IrCOMM protocol is one of the sub-protocol of IrDA and widely used in portable devices. RAW-Ir data transmission mode can be connected to the devices with raw infrared port for printing, while IrCOMM mode can be connected to the devices with IrCOMM protocol for printing.

RAW-Ir can work under 9600bps, 19200bps, 38400bps, 57600bps, 115200bps, the baud rate of RAW-Ir is same to that of serial interface.

Notice:
1) To use the T5's infrared port, a computer or Personal Digital Assistant (PDA) with IR port is required.
2) Position a PDA conforming to the specifications in point not more than 50 centimeter away from the printer's infrared port. Make sure the two ports are in front of each other with an angle of not more than 30° on the four side.

3.3.3 （Bluetooth）Interface

PDA, Laptop and other communication devices with Bluetooth can drive T5-BT to print by the Bluetooth interface. T5-BT is compatible with Bluetooth 2.0 protocol. Power grade is CLASS 2; effective communication distance is 10 meters. The name of the printer is T5 Bluetooth Printer, the initial password is "1234"; users can change the printer name and password by using Setting Tools.

3.3.3.1 Bluetooth Pairing:

The method for the pairing between T5-BT with the host device is:
1. Turn on the printer;
2. Host device searches for the outer Bluetooth device;

3. If there are other Bluetooth devices, please select T5 Bluetooth Printer;
4. Put in password "1234"
5. Pairing finished.

Notice: If the printer name has been changed, please be sure not turn on more than one printer, otherwise it will be difficult to justify which printer been paired.

3.3.3.2 Binding of Address

Binding: once the printer remembers the device's address, it only can connect with the device and can't connect with others. So in this case, if the printer needs to connect with other device, user can delete the remembered address.

No binding: in this case, the printer can be searched or paired by any other device. So when the printer needs to connect with a fixed device, it would be better bind address.

3.4 Other Functions

3.4.1 Stand-by & Turn Off Automatically Mode

In order to save the power and prolong the using time, T5 adopts advanced stand-by and awakening automatically technology.

Stand-by mode: the printer will fall into stand-by mode after at least 5 seconds without usage and all the buttons untouched, so that it can save the consumption as much as possible. It can restore to normal working mode by receiving data or pressing any buttons.

The printer also can be set to turn off automatically mode by T5 Setting Tools. In turn off automatically mode, the printer will power off if without data sent in within 5 minutes.

3.4.2 Paper End Alarming
When the paper is run out, the buzzer of the printer will ring 2 times, informs the user to load paper.

3.4.3 Black Mark
If user uses ready printing black mark to localize the receipt, please be sure to abide by the following black mark ready printing regulation when print the black mark, otherwise the black mark can't be recognized by the printer. The black mark ready printing regulation:

Print position: as the following figure shows, the default black mark is at the edge of left side. (You can change to right side by using T5 Setting Tools.

Width range: ≥18mm

Height range: 4mm≤height≤6mm

Reflectivity to infrared ray: <10% (the reflectivity of the other parts of the paper black mark width to infrared ray >65%)
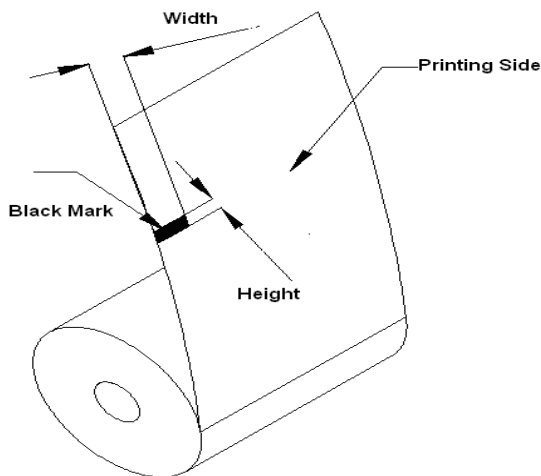
3.5 Indicators and Buzzer

There are three indicators for T5 printer, they are【POWER】, 【MODE】 and 【FEED】, the 【POWER】and 【MODE】 indicators are blue, the 【FEED】 indicator is red.

Indicator	Status	Buzzer
Solid blue (right)	Normal working mode	Beep once when power on/off
Solid blue (right)	Stand-by mode	—
Blue blinking (right)	Battery low power	—
Red blinking (left)	Out of paper	Beep once every two seconds

Solid blue (middle)	Charging finish	─
Solid red(middle)	Charging	─
Solid purple(middle)	Battery error	

3.6 Printer setting

Users can set the printer by using the 〈T5 Setting Tools〉 software provided by us. The settings include: serial baud rate, data format, black mark, language, font, density, RAW-IR baud rate(only for T5-Ra), IrDA device name (oly for T5-Ir), Bluetooth device name and password etc. Regard to the setting method please refer to the "HELP" in 〈T5 Setting Tools〉

Chapter 4 Printing Control Command

4.1 Summary

T5 offers ESC/POS print command set, FS Chinese print commands. Each command is described in following format:

Section	Commands	Description
Printer printing commands		
4.1.1	ESC @	Initialize printer
4.1.2	NULL	Awaken printer
4.1.3	FF	Print and feed paper to black

		mark position
4.1.4	LF	Print and feed line
4.1.5	CR	Print and carriage return
4.1.6	ESC J n	Print and feed paper for n lines
4.1.7	ESC d n	Print and feed paper for n lines
4.1.8	HT	Horizontal tab
4.1.9	FS U nL nH	Print Unicode Character
Character setting commands		
4.2.1	ESC ! n	Set print mode
4.2.2	GS ! n	Set character size
4.2.3	ESC - n	Select/cancel underline print
4.2.4	ESC E n	Select/cancel bold font print
4.2.5	ESC G n	Select/cancel overprinting
4.2.6	GS B n	Select/cancel reverse print
4.2.7	ESC V n	Select/cancel character rotation
Print setting commands		
4.3.1	ESC $ nL nH	Set absolute print position
4.3.2	ESC D n1 n2…nk NULL	Set horizontal tab position
4.3.3	ESC \ nL nH	Set relative printing position
4.3.4	ESC 2	Set default line spacing
4.3.5	ESC 3 n	Set line spacing

4.3.6	ESC SP n	Set line character spacing
4.3.7	GS L nl nH	Set left spacing
4.3.8	ESC a n	Set alignment
Graphic/Image print commands		
4.4.1	ESC * m nL nH d1…dk	Set bit-image
4.4.2	GS * x y d1…dk	Define downloaded bit-image
4.4.3	GS / n	Print downloaded bit-image
4.4.4	GS P n	Print prestored bit-image
Curve Printing commands		
4.5.1	GS '	Print curve
4.5.2	GS "	Print character on curve
4.5.3	ESC '	Print curve
User-defined character commands		
4.6.1	ESC % n	Select/cancel user-defined character set
4.6.2	ESC & y c1…	Define user-defined character set
4.6.3	ESC ?	Delete user-defined character set

4.1 Basic Control Commands
4.1.1 ESC @
[Name]：Initialize printer

[Format]：   ASCII   ESC   @
              Hexadecimal   1B   40
              Decimal   27   64

[Description]：Clear the data in the print buffer; Restore the default of each print command.

[Notice]: If not restore to ex-factory setting, the default setting won't be changed.

4.1.2 NULL

[Name]：Awaken printer

[Format]：   ASCII   Null
              Hexadecimal   00
              Decimal   0

[Description]：Awaken printer.

[Notice]:

• This command is used to awaken the printer, but it is not compulsory.

• If printer is not in standby mode when received this command, the command would be ignored.

• After the printer awakened, the printing commands are according with the commands before the printer standby.

4.1.3 FF

[Name]: Print and feed paper to black mark position

[Format]:   ASCII   FF
             Hexadecimal   0C

| | Decimal | 12 |

[Description]:Print and feed paper to the position of black mark, if there is no black mark, then feed paper about 30mm and stop, the criterion for black mark please refer to Appendix B. This command is only valid for black mark mode printer. The user can enable or disable black mark by T5 Setting Tools. If in the mode of black mark disabled, this command is invalid.

 [Reference]: LF, CR, ESC d, ESC J

4.1.4 LF

[Name]: Print and feed line

[Format]:	ASCII	LF
	Hexadecimal	0A
	Decimal	10

[Description]: Prints the data in the print buffer and feeds one line based on the current line spacing.

[Notice]: This command sets the print position to the beginning of the line.

4.1.5 CR

[Name]: Print and carriage return

[Format]:	ASCII	CR
	Hexadecimal	0D
	Decimal	13

[Description]: The command functions the same as LF.

[Notice]: Sets the print starting position to the beginning of the line.

4.1.6 ESC J n

[Name]: Print and feed paper

[Format]: ASCII   ESC J n
      Hexadecimal 1B 4A n
      Decimal   27 74 n

[Description]: Feed paper for n vertical dot spacing.

[Range]: 0 ≤ n ≤ 255.

• one vertical dot spacing is 0.125mm, below is the same.

[Reference]: ESC d

4.1.7 ESC d n

[Name]: Print and feed paper n lines

[Format]: ASCII   ESC d n
      Hexadecimal 1B 64 n
      Decimal 27 100 n

[Range]: 0 ≤ n ≤ 255.

[Description]：Print the data in the buffer and feed paper for n lines.

[Notice]: Set the beginning of the line as the printing position by this command.

[Reference]: ESC J

4.1.8 HT
[Name]: Horizontal tab

[Format]:	ASCII	HT
	Hexadecimal	09
	Decimal	9

[Description]: Moves the print position to the next horizontal tab position.

[Notice]:

• Horizontal tab positions are set with ESC D.

• This command is ignored unless the next horizontal tab position has been set.

[Reference]: ESC D

4.1.9 Print Unicode Character
[Name]: Print Unicode Character

[Format]:	ASCII	FS	U	nL	nH
	Hexadecimal	1C	55	nL	nH
	Decimal	28	85	nL	nH

[Description]: Print n(n=nL+nH*256) Unicode characters.

[Notice]: Unicode is 2 bytes code, T5 adopts GB18030 character library, so only can support GBK Unicode, and can't support other countries' Unicode font.

4.2 Character Setting Commands
4.2.1 ESC ! n
[Name]: Select print mode

[Format]:   ASCII   ESC   !   n

             Hexadecimal 1B   21 n

             Decimal   27   33 n

[Description]: Select print mode(s) using n as follows:

Bit	Value	Description
0	0	6*12/12*12
	1	8*16/16*16
1	-	Undefined
2	-	Undefined
3	0	Cancel bold font
	1	Select bold font
4	0	Cancel double height mode
	1	Select double height mode
5	0	Cancel double width mode
	1	Select double width mode
6	-	Undefined
7	0	Cancel underline mode
	1	Select underline mode

[Notice]:

• When selected double-height or double-width mode, double size characters are printed

• When both double-height and double-width modes are selected, quadruple size characters are printed.

• When some characters in a line are double or more height, all the characters on the line are aligned at the baseline.

• ESC - can also turn on or off underline mode. However, the

setting of the last received command is effective.

• ESC + can also select character size. However, the setting of the last received command is effective.

• This command is effective for both alphanumeric and Chinese character.

[Default]: n = 0

[Reference]: ESC -, ESC +

4.2.2 GS ! n

[Name]：Enlarge character

[Format]：	ASCII	GS ! n
	Hexadecimal	1D 21 n
	Decimal	29 33 n

[Description]:

N indicate responsed bdouble height, double width information.

0	1	2	3	Double -height	4	5	6	7	Double-width
0	0	0	0	1	0	0	0	0	1
1	0	0	0	2	1	0	0	0	2

4.2.3 ESC - n

[Name]: Select／cancel underline

[Format]:	ASCII	ESC – n
	Hexadecimal	1B 2D n
	Decimal	27 45 n

[Description]: n

n	Description
0	Cancel underline
1	Select underline (1 dot width)

[Reference]: ESC !

4.2.4 ESC E n

[Name]: Select／Cancel bold font print

[Format]：   ASCII   ESC   E   n
             Hexadecimal   1B   45   n
             Decimal   27   69   n

[Description]：When the lowest bit of n is 0, cancel bold font print. When the lowest bit of n is 1, select bold font print

4.2.5 ESC G n

[Name]: Select/cancel overprinting

[Format]：   ASCII   ESC   E   n
             Hexadecimal   1B   45   n
             Decimal   27   69   n

[Description]：When the lowest bit of n is 0, Select overprinting. When the lowest bit of n is 1, cancel overprinting

4.2.6 GS B n

[Name]：Select/cancel reverse print

[Format]：   ASCII   ESC   B   n
             Hexadecimal   1D   42   n
             Decimal   29   66   n

[Description]: If n=1，select reverse print；n=0，cancel reverse print。 Default set n=0。

4.2.7 ESC V n

[Name]：Select/cancel character rotation

[Format]：	ASCII	ESC	c	n
	Hexadecimal	1B	56	n
	Decimal	27	86	n

[Description]: n.

n	Meaning
0	Cancel rotation
1	90 clockwise
2	180 clockwise
3	270 clockwise

4.3 Print setting commands
4.3.1 ESC $ nL nH

[Name]: Set absolute print position

[Format]：	ASCII	ESC	$	nL	nH
	Hexadecimal	1B	24	nL	nH
	Decimal	27	36	nL	nH

[Range]： 0 ≤ nL ≤ 255, 0 ≤ nH ≤ 256

[Description]：Sets the distance from the beginning of the line to the position at which subsequent characters are to be printed. The distance from the beginning of the line to the

print position is [(nL + nH × 256) (vertical or horizontal motion unit)] inches.

[Notice]: Settings outside the specified printable area are ignored.

[Reference]: ESC \

4.3.2 ESC D n1 n2…nk NULL

[Name]：Sets horizontal tab positions.

[Format]：	ASCII	ESC D	n1 n2 n3…	NULL
	Hexadecimal	1B 44	n1 n2 n3…	00
	Decimal	27 68	n1 n2 n3…	0

[Description]：

• n specifies the column number for setting a horizontal tab position from the beginning of the line.

• k indicates the total number of horizontal tab positions to be set.

• The horizontal tab position is stored as a value of [character width × n] measured from the beginning of the line. The character width includes the right-side character spacing, and double-width characters are set with twice the width of normal characters.

• This command cancels the previous horizontal tab settings.

• When setting n = 8, the print position is moved to column 9 by sending HT.

• Up to 32 tab positions (k = 32) can be set. Data exceeding 32 tab positions is processed as normal data.

• Transmit [n] k in ascending order and place a NUL code 0 at the end.

• When [n] k is less than or equal to the preceding value [n] k-1, tab setting is finished and the following data is processed as normal data.

• ESC D NUL cancels all horizontal tab positions.

• The previously specified horizontal tab positions do not change, even if the character width changes.

• The character width is memorized for each standard and page mode. [Default] The default tab positions are at intervals of 8 characters (columns 9, 17, 25,...) for font A (12 ´ 24).

[Reference] HT

4.3.3 ESC \ nL nH

[Name]: Set relative printing position

[Format]:	ASCII	ESC	\	nL nH
	Hexadecimal	1B	5C	nL nH
	Decimal	27	92	nL nH

[Range]: $0 \leq nL \leq 255$; $0 \leq nH \leq 1$.

[Description]: Sets the print starting position based on the current position by using the horizontal or vertical motion unit. This command sets the distance from the current position to n [(nL + nH × 256)horizontal motion unit]

[Notice]:

   • Any setting that exceeds the printable area is ignored.

• The print starting position moves from the current position to [N × horizontal motion unit]

4.3.4 ESC 2
[Name]: Select default line spacing
[Format]:　　ASCII　　　ESC 2
　　　　　　Hexadecimal 1B　32
　　　　　　Decimal　　27　50
[Description]: Set the current character line spacing as the default one: 6 dot spacing.
[Notice]: The height of the character is not included by the 6 dot spacing.
[Reference]: ESC 3

4.3.5 ESC 3 n
[Name]: Set line spacing
[Format]:　　ASCII　　　ESC 3　n
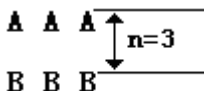　　　　　　Hexadecimal 1B　33　n
　　　　　　Decimal　　27　51　n
[Range]: 0 ≤ n ≤ 255
[Description]: Set n vertical dot spacing as the character line spacing.
[Default]: n = 3
[Reference]: ESC 2
[Example]:

Should input the command：1B 33 03

4.3.6 ESC SP n

[Name]: Set character spacing

[Format]:　　ASCII　　　ESC SP n

　　　　　　Hexadecimal 1B　20 n

　　　　　　Decimal　　27　32 n

[Range]：0 ≤ n ≤ 255

[Description]：Set n horizontal dot spacing as the character's right spacing (exclude the character's height).

[Notice]: When in the double width mode, the character's right spacing is two times to the normal spacing. When the characters are enlarged, their right spacing also will be enlarged accordingly.

[Default]: n = 0

4.3.7 GS L nL nH

[Name]：　Set left margin

[Format]：　ASCII　　　GS L　 nL nH

　　　　　　Hexadecimal 1D　4C　nL nH

　　　　　　Decimal　　29　76　nL nH

[Range]：0 ≤ nL ≤ 255 , 0 ≤ nH ≤ 255

[Description]：The position set by this command is absolute

position, Set n horizontal dot spacing as the character's left spacing, nL nH are n's LSB and MSB, N=nL + nH × 256.
[Default]: n=0，that means there is not any left margin.

4.3.8 ESC a n
[Name]：Set alignment

[Format]：	ASCII	ESC a	n
	Hexadecimal	1B 61	n
	Decimal	27 97	n

[Description]：

n	Description
0	Align left
1	Align middle
2	Align right

4.4 Graphic/Image print commands
4.4.1 ESC * m n1 n2 [d]k
[Name]：Set bit-image mode

[Format]：	ASCII	ESC *	m n1 n2 [d]k
	Hexadecimal	1B 2A	m n1 n2 [d]k
	Decimal	27 42	m n1 n2 [d]k

[Range] m = 0, 1, 32, 33
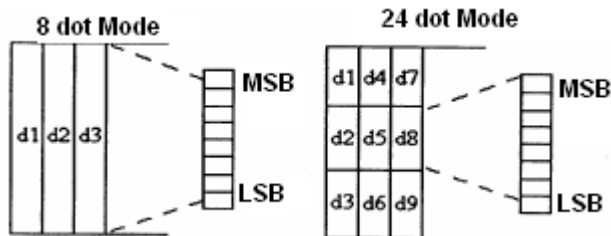
$0 \leq n1 \leq 255$

$0 \leq n2 \leq 3$

$0 \leq d \leq 255$

[Description]: Selects a bit-image mode using m for the number of dots
specified by n1 and n1, as follows:

m	Vertical Dot Number (Height)	Horizontal Enlargement
0	8	2
1	8	1
32	24	2
33	24	1

4.4.2 GS * x y d[]

[Name]: Define downloaded bit-image

[Format]：	ASCII	GS *	x y d[]
	Hexadecimal	1D 2A	…
	Decimal	29 42	…

[Description]：Use appointed bit number by x and y to define the downloaded bit-image。

• x*8 is the dot number of horizontal.

• y*8 is the dot number of vertical.

[Note]

• If x*y is off-limit, then the command is forbidden.

• d means the image data. 1 print, 0 not print

• use this command to define the downloaded bit-image, use command GS/n to print the downloaded bit-image.

• In the following circumstances，clear the definition of downloaded bit-image.

    1. run ESC @ command

    2. printer is reset and the power is off.

4.4.3 GS / n

[Name]: Print downloaded bit-image

[Format]： ASCII　　　GS / n

             Hexadecimal 1D 2F n

             Decimal　　29 47 n

[Description]：Use n specified mode to print the down-loaded bit-image which is defined by GS * command.

Select the following mode for n;

n	Enlarging mode
0	normal
1	Double height
2	Double width
3	Double height & width

4.4.4 GS P n

[Name]: Print prestored bit-image

[Format] : ASCII　　　　　GS P n

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	Hexadecimal	1D 50 n
	Decimal	29 80 n

[Description] :0<=n<=9.Print prestored bit-image, the number of image is 1<=n<=9

[Note]:

• The command is invalid when the number of bit-image has not been defined.

• The command is not affected by the print mode (bold font, overlapping, underline, etc.).

• If the width of bit-image is more than one line, the content which is outside the line will not be printed.

• Upload the bit-image should use specified tool, thus the bit-image will not be lost unless it is covered by new image.

4.5 Curve print commands

4.5.1 GS '

[Name]：Print curve

[Format]： ASCII   GS '   n   x1sL x1sH x1eL
                          x1eH … xnsL xnsH xneL xneH
          Hexadecimal 1D   27   n   x1sL x1sH x1eL
                          x1eH … xnsL xnsH xneL xneH
          Decimal   29 39   n   x1sL x1sH x1eL
                      x1eH … xnsL xnsH xneL xneH

 [Description]: As following picture shows: each curve is composed by many horizontal line segments (Dot can be regarded as the line segment with 1 length.) This

command is used to print n line segments on one horizontal line. Using the command continuously can print out the line segment the user required.

- N is the number of line segment.
- xksL is the LSB for the horizontal coordinate of initial dot for No. k line segment;
- xksH is the MSB for the horizontal coordinate of initial dot for No. k line segment;
- xkeL is the LSB for the horizontal coordinate of ending dot for No. k line segment;
- xkeH is the MSB for the horizontal coordinate of ending dot for No. k line segment;
- The coordinate is calculated from the left side of print area, minimum value is 0, maximum is 239, that is, the maximum value for xkeL+xkeH*25 is 239.
  - The data for line segment is no need to arrange in order.

4.5.2 GS "

[Name]：Print characters on the curve

[Format]：	ASCII	GS "	n xL xH c1 c2 … NULL
	Hexadecimal	1D 22	n xL xH c1 c2 … NULL
	Decimal	29 34	n xL xH c1 c2 … NULL

[Description]:

• The printer will print the characters rotated 90 degree from the current line after receives this command.

• When there has been characters on the horizontal line, if

want to print other characters, then need to set the character code to 0 or 1;

• Only can print 2 characters on each horizontal dot line.

[Reference]: GS '

4.5.3 ESC '

[Name]：Print curve

[Format]：　ASCII　　　ESC 'n　x1 x2 …… xk CR
　　　　　　Hexadecimal 1B　27　n　x1 x2 …… xk 0D
　　　　　　Decimal　　27　39　n　x1 x2 …… xk 13

[Description]: This command is used to print curve along the paper feeding direction. N is the curve number need to print, it should be within the maximum dots of each line.

There are n curve dots within one line. x1，x2……xk indicates the position of the curve. The number of xk equal to n. Each xk should be within the maximum dots of each line. CR means to print this dot line. The whole n curves graphics is composed by x1，x2……xk and printed by them.

[Notice]: This command is more suitable for such curves which are detracted within same line. If there are many continuous line segment within one line, GS' is more convenient.

[Reference]: GS '

4.6 User-defined character commands
4.6.1 ESC % n
[Name]: Select/cancel user-defined character

[Format]:
ASCII	ESC	%	n	
Hexadecimal	1B	25	n	
Decimal	27	37	n	

[Range]: 0 ≤ n ≤ 255

[Description]: Select or cancel user-defined character set.

When n (LSB)=0，cancel user-defined character set.

When n (LSB)=1，select user-defined character set.

[Notice]:

    • When cancel user-defined character set, auto select built-in character set. It still can use if won't delete the defined characters.

• n only LSB is available.

[Default] n = 0

[Reference] ESC &, ESC ?

4.6.2 ESC & y c1 c2 [x1 d1...d(y *x1)]...[xk d1...d(y * xk)]
[Name]：Define user-defined character

[Format]:
ASCII	ESC &	y c1 c2 [x1 d1...d(y ´ x1)]...[xk d1...d(y ´ xk)]
Hexadecimal	1B 26	y c1 c2 [x1 d1...d(y ´ x1)]...[xk d1...d(y ´ xk)]
Decimal	27 38	y c1 c2 [x1 d1...d(y ´ x1)]...[xk d1...d(y ´ xk)]

[Range]: y = 3, font A (12 × 24), y = 2, font B (8× 16), 32 ≤ c1 ≤ c2 ≤ 126 x = 12, font A (12 × 24), x = 8, font B (8× 16), 0 ≤ d1 ... d(y × xk) ≤ 255
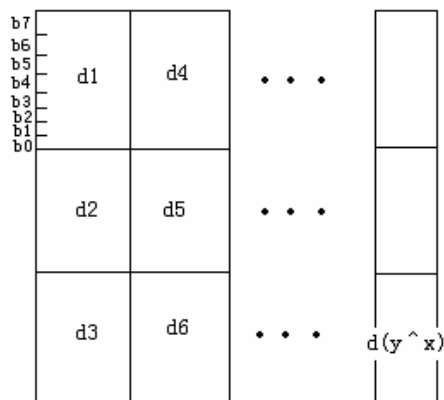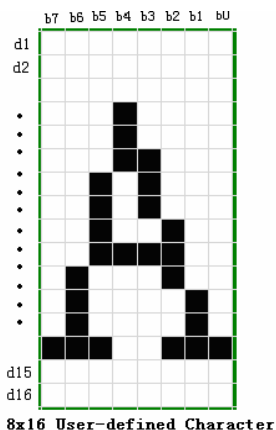
[Description]: Define user-defined character.

• y specify the vertical byte number, when define the characters of font A, y=3; when define the characters of font B, y=2

• c1 specify the code of initial character, c2 specify the code of terminal character.

• x specify the vertical byte number, when define the characters of font A, x≤12; when define the characters of font B, x≤8

• k=c2-c1+1

[Notice]

• The code range of defined character: from <20>H to <7E>H.

• Can define the continuous codes for several characters. When only one character is needed, c1 = c2.

• d is the dot data of the character.

Please refer to the following:

b7 b6 b5 b4 b3 b2 b1 b0

d1
d2

·
·
·
·
·
·
·
·
·
·

d15
d16

8x16 User-defined Character

b7
b6
b5
b4
b3
b2
b1
b0

d1	d4	· · ·	
d2	d5	· · ·	
d3	d6	· · ·	d(y^x)

12x24 User-defined Character

• Defining the data of user-defined character is (y × x) bytes.

• Setting the printing dot's corresponding bit is 1 or non-printing dot's one is 0.

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• The user-defined characters will be deleted in the following situation:

1. Carry out ESC @.

2. Printer reset or power turn off.

[Default] Built-in character set.

[Reference]: ESC %.

4.6.3 ESC ?

[Name]: Delete user-defined character

[Format]:	ASCII	ESC	?	n
	Hexadecimal	1B	3f	n
	Decimal	27	63	n

[Range]: $32 \leq n \leq 126$

[Description]: Delete user-defined character set, and restore the characters coded by n to default characaters.

Chapter 5 Appendix

Character Set

十六进制	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2		!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	